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SYMBOLISING THE REAL OF MATHEMATICS EDUCATION

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This text, occasioned by a critical reading of Tony Brown's new book *Mathematics Education and Subjectivity*, aims at contributing to the building of a sociopolitical approach to mathematics education based on Lacanian psychoanalysis and Slavoj Žižek's philosophy. Brown has been bringing into the field of mathematics education the work of these two scholars, and his work has been important in understanding the cultural dynamics of school mathematics. This article highlights the limitations of Brown's use of Lacanian theory, and outlines a framework to understand students' learning not in terms of the inherent properties of mathematics, but in terms of the role this school subject plays within political economy.

Keywords: Brown, Lacan, Žižek, ideology, desire, political economy.

1. Introduction

Mathematics education as a field of research has been historically dominated by a discourse that orbits around the development of better stratagems to teach and learn mathematics, and emphasizes mathematics and the psychology of the child as the primary theoretical and methodological frameworks. In the last 20 years, some researchers have been criticizing such an approach, arguing that many of the problems that students and teachers experience in schools cannot be reduced to a solely mathematical or psychological hindrance. As recently expressed by Morgan (2014), in one of this journal's special issues dedicated to social theory, the use of socially and politically oriented research frameworks results not from a will to satisfy some theoretical caprice or to implement an innovative methodology, but from the need for a broader and richer understanding of many of the problems experienced by students and teachers in their daily work. When we start posing what Morgan calls 'unsophisticated questions' such as 'Why in a class of thirty students will there always be some (or many) who fail?', 'Why are teachers asked to mark students?', or 'Why does school mathematics

function so efficiently as a gatekeeper?’ then you will hardly find any answer in research. These questions resist any straightforward investigation. Yet they make us aware that the solutions for the problems of failure in school mathematics cannot be solved within mathematics education alone. For *all* students to have a chance, something will have to change elsewhere. It is precisely this ‘elsewhere’ – the entire sociopolitical arena that schematizes what it means to teach and learn mathematics – that social theory potentially brings into the research gaze.

Against this background, Tony Brown’s work has been vital in positioning the problems that students and teachers feel in their daily school lives at a level where broader social systems can be considered. In his work, such a move was accompanied by an emphasis on contemporary theory as a privileged framework to analyse some of the core issues in mathematics education research. Scholars such as Derrida, Foucault, Barthes, Ricoeur, Habermas and, more recently, Lacan, Badiou and Žižek, have been used by Brown to analyse how teachers (e.g. Brown & McNamara, 2011), students (e.g. Brown, 2001) and researchers (e.g., Brown, 2008b) make sense of their worlds. The theories of these scholars have allowed Brown to conceptualize mathematics education as more than the encounter between an individual and a mathematical object. This is particularly important given the realisation that many of the problems that students and teachers experience in their school lives are not ‘didactical’ ones, in the sense that they can be approached through better stratagems to learn and teach mathematics, but political ones, having to do with the sociopolitical organization of schooling (Brown & McNamara, 2011; Gutiérrez, 2010; Pais & Valero, 2012; Valero, 2004).

How to develop theoretical frameworks where such political dimension can be taken into account has been one of the major concerns in Brown’s work. Furthermore, Brown’s research not only provides fresh theoretical insights into mathematics education, but it does so through a critical dialogue with other theoretical approaches prevailing in the field, such as Piagetian and Vygotskian psychologies (Brown, 2008a). Thus, it is not surprising that in the last five years Brown’s theoretical developments have been the target of thoughtful criticism from researchers resistant to some of the contemporary scholars used by Brown in his work, particularly the French psychoanalyst Jacques Lacan (Presmeg & Radford, 2008; Roth, 2012).

Brown’s recent book, *Mathematics Education and Subjectivity*, offers the reader an account of this ongoing discussion concerning the issue of *subjectivity* in mathematics

education¹ – chapters 5, 6 and 7 draw on material originally published in *Educational Studies in Mathematics*, where Brown confronts Lacan's theory of the subject with Piaget's and Vygotsky's theories. Furthermore, Brown draws on the contemporary reading of Lacanian psychoanalysis carried out by the Slovenian philosopher Slavoj Žižek to analyse how political structures shape teachers, students and mathematics. Far from offering technical solutions to current models of practice, Brown's book seeks to enlarge the scope of research in mathematics education, by bringing into discussion many of the most recent developments within contemporary theory, around the two central topics of *subjectivity* and *change*.

Brown's criticism hits at the core of a certain mathematics education research 'where standalone "humans" apprehend distinct mathematical "concepts"' (2011, p. 2). Through his engagement with Lacanian theory, Brown invites us to conceptualize humans as more than knowing subjects; it invites us to conceptualize humans as *desiring* subjects, with all the *sociopolitical* charge that desire has within Lacanian theory, as I shall explore in the following pages. Moreover, Brown contests the linearity that is assumed between research and practice (p. 96). Although a common feature of mathematics education research is the elaboration of 'recipes' (Sriraman & English, 2010, p. 27) for the problems of practice, not much is said about the social and political conditions that have to be met so that such recipes can actually become a force of change. Such conditions are usually taken for granted – by providing images of schools, students and teachers that may not be lived up to in real life – or discarded as being beyond the scope of researchers' endeavours (e.g. Abreu, Bishop & Presmeg, 2002). Brown's research not only brings such vicissitudes into the research gaze, it also calls researchers' attention to the role that theory has in constituting what is perceived as the reality of school mathematics.

The fact that Brown's research has been causing such an enthusiastic response by scholars such as Wolff-Michael Roth, Luis Radford and Norma Presmeg proves that he is touching important nerves of mathematics education research. Presmeg and Radford (2008) and later Roth (2012), criticized Brown's reading of sociocultural theories, and pointed out the benefits of socioculturalism and the flaws of Lacanian theory for theorizing the teaching and learning of mathematics. While these scholars criticized Brown's developments from the standpoint of socioculturalism, I am interested in questioning Brown's work from the point of

¹ A few months after the publication of Brown's book, Wolff-Michael Roth published a critical reading of the book (Roth, 2012), to which Brown responded in return (Brown, 2012).

view of Lacanian theory itself.² In my quest to understand the problems I felt as a teacher, I also became engaged with Lacanian psychoanalysis and Žižek's philosophy, and I truly believe that the axis Lacan–Žižek can bring researchers closer to the complex problems that students and teachers experience in schools. I am, however, suspicious about the emphasis given by Brown to *culture* as the locus of change. Lacan himself avoids the term culture and, when referring to it, does it in a quite dishonoured way. Within the Lacanian framework, culture is a kind of shit-disposal system of society (Lacan, 2008a, pp. 65–75). That is, it provides the necessary decorum for what is repressed. In this sense, culture and ideology are not different: they both serve the purpose of evacuating shit, understood as what needs to be repressed so that a sense of social cohesion can be kept. Culture homogenises what is presented as a threat to this same culture, and is an obstacle to a critical understanding of the world.³ For Lacan, the search for truth is the search for shit. Thus, I shall conjecture that perhaps cultural renewal is not enough if the purpose is to solve the impasses of school mathematics; and Brown's notion of cultural renewal may end up functioning as another mechanism of repression of the role school mathematics plays within capitalist economics.

I strongly support Brown's research at the level of the criticism he develops on how mathematics education research tends to create an imaginary picture of school mathematics, and in the way he uses contemporary theory to shed light on how broader structures influence what is happening in the classroom. Brown's aim is to develop a theorization – a *symbolisation* – where what he calls, drawing on Lacan, the *real* of schools can be taken into account. Brown is trying to symbolize what is usually silenced in research – i.e. the shit. I will argue, however, that the kind of symbolisation proposed by Brown falls short of giving an account of what I consider to be the real of schools: the worldwide accreditation system that runs indifferent to the didactical, curricular and even cultural innovations perpetrated by researchers, governors and practitioners. I will take support from Lacan's reading of Marx (Lacan, 2007), where it is economy, not culture, that is the locus of change. A proper economic reading of school mathematics has been absent from the *social* and *sociopolitical*

² Elsewhere (Pais, in press), I engage in a discussion that extends the debate between sociocultural theories (based on the recent articles of Presmeg and Radford (2008), Radford and Roth (2011), and Roth (2012)), and Lacanian psychoanalysis. Namely, I discuss the dialectic involved in the way researchers conceive the relation between person and culture, or between psychology and sociology. My purpose here is not to enter into this debate, but provide instead a different interpretation of Lacan's work from the one emerging from Brown's theorizations around mathematics education and subjectivity.

³ As Lacan (2008a, p. 74) said, in his own style, “if you want to do logic, or anything else to do with modern science, you have to start before you have been completely cretinized, by culture of course”, and he adds, “obviously, we are always a little cretinized because there is no escaping secondary school”.

turns (Pais, 2014). By further pushing Brown's theorization, I highlight the potential that Lacanian theory has to posit mathematics education as an element of a broader political and economic arrangement. Hence, this article follows on from my previous research where I sought to probe the way in which researchers conceive the importance of mathematics (Pais, 2013; Pais & Valero, 2012). By outlining a theoretical framework whereby students' learning could be understood not in terms of the inherent properties of mathematics, but in terms of the role this school subject plays within political economy, I seek to enrich the potential that social theory has to render problematic some of the taken-for-granted assumptions that prevail in the field. It is my contention that Lacanian theory offers us the possibility to renew mathematics education not just in itself – better classrooms practices, different understandings of what mathematics is and how it can be taught and learned – but also *for itself*, that is, to renew the way researchers conceive the importance of this school subject.

2. The unconscious and the pacifying screen of ideology

At the centre of Lacanian theory is the idea that language is the necessary condition for subjectivity. Through language as name-giving power, that is, through the emergence of what Lacan (2000) calls the *symbolic order*, the subject comes into being. The only way for a person to express their 'being' is through the symbolic order, through the *logic of the signifier*. This logic is independent of the subject that it represents. That is to say, the meaning of the 'said' does not belong to the person who says it, but is determined by the place it occupies within the signifier chain.

It was Freud who first extensively explored this discrepancy between what the individual wants to say and what they actually say. According to Miller (1999) it is in this discrepancy that Freud situated what he called the *unconscious*: 'as if for this wanting-to-say of mine, which is my "intention of signification", another wanting-to-say was substituted, which would be that of the signifier itself and which Lacan designated as "the desire of the Other"' (p. 2). This Other is not 'outside' the individual; rather it speaks through them. As Lacan stressed after Freud, *the self is an Other*, that there, where the subject speaks, *an Other speaks for her* (Fink, 1995, p. 1). Lacan's assertion that "the unconscious is politics"⁴ means precisely that what we think to be the innermost core of our being – the level of *desire* – is not only unconscious but schematized by politics. Žižek (1994, 2012) concludes that it is

⁴ Lacan, seminar of May 10, 1967, in *Le séminaire, Livre XIV: La logique du fantasme* (unpublished). Quoted in Žižek (2012, p. 551).

precisely *ideology* that organizes our desires, that teaches us what and how to desire. This is why Brown (2011) emphasises that the goal of his research with teachers is not to get at the intention of what the teachers say, but rather “to understand how the policy was operating through the teachers” (p. 84).

Here resides the importance of putting under critical scrutiny the constructs of our own research, the speech of the teachers and the nature of students’ engagement with mathematics. It implies, as posed by Brown (2011, p. 109), a belief in the unconscious as this facet of human subjectivity that runs indifferent to the subject’s (conscious) knowledge. In other words, it implies an assumption that there is a perfectly articulated knowledge for which, strictly speaking, no subject is responsible. As posed by Lacan (1999), “the unconscious is presupposed on the basis of the fact that there is, somewhere in the speaking being, something that knows more about things than he does, but this is not an acceptable model of the world” (p. 88). Indeed, to assume that at the core of one’s subjectivity there is something that escapes our comprehension is not easy. Such a posture is becoming more difficult to assume since today’s leading ideology is one that obliterates the unconscious by conceiving the subject as an autonomous self-conscious one (Althusser, 2000; Miller, 2006).

Within the Lacan–Žižek frame (which, for this matter, is not different from the Althusserian one), ideology is not a distorted representation of a true reality. Ideology *is* the reality, we are ‘naturally’ in ideology; our natural, immediate, sight is ideological. Thus the importance for Brown (2008a, p. 239) of questioning not only particular aspects of the teaching and learning of mathematics, but also what he calls, after Lacan, the *big Other* of mathematics education: the entire symbolic matrix organising our engagement in the field. In other words, Brown is calling attention to the importance of questioning the ideology sustaining mathematics education as a field of research.

As noted by Brown (2008a, p. 239), this is a question that often remains understated. If we consider that ideology is a defence against some traumatic *real*, a “fantasy-screen” (Žižek, 2008a, p. 7) set on putting order in a situation that otherwise will seem chaotic or impossible, then the question to be asked when carrying out an ideology critique is: which repressed real does a given ideology conceal? As rightly described by Brown (2011) in chapters 5 and 6, where he discusses Piaget, Vygotsky and Lacan, mathematics education research shows a propensity to disavow the *actuality* of the classroom. That is, mathematics education research is often looking at what Skovsmose (2005) calls a *prototypical classroom* and ignoring everything that somehow does not fit the picture of a well-organized and equipped class, with a teacher desiring to teach and students willing to learn. In much of the research into

mathematics education, students and teachers are depicted as fully assuming the symbolic mandate conferred upon them. When problems appear they tend to be ignored by research, or ‘solved’ through the implementation of a better practice. This is when research applies more to pre-fixed ideas of what is schooling, a teacher and a student, than to what Brown (2008a) calls the *real* of school, where factors such as “the quest to please the teacher; the satisfaction derived from particular relations with a teacher; the perverse pleasures achieved by those who paint themselves as mathematical illiterates, etc.” (Brown, 2008a, p. 239) make the daily lives of students and teachers. Perhaps we can say that the reigning ideology in mathematics education research is one that obliterates the real of schools for the sake of research.

Brown’s work criticizes two of these research ideologies in mathematics education: *constructivism* (within a Piagetian trend) and *socioculturalism* (within a Vygotskian trend). Despite their differences, both constructivism and socioculturalism create an ideological shield set on effacing particularities of the learning process that somehow do not fit the encounter between a piece of mathematical content and a subject willing to learn it. Brown’s challenge is to symbolise these particularities, bring them into the research gaze. This is particularly evident in the research Brown does with teachers. However, symbolizing the real is an unlimited task. The symbolic is always lacking something. In Žižek’s words, an ideology – as a symbolic construct, a “social fantasy” (1992, p. 142) – is always a necessary counterpart to some real antagonism. Ideology is precisely the way the antagonistic fissure is masked (Žižek, 1992, p. 142). And, for Žižek, the social antagonistic fissure is first of all *economic*. How can we then posit the real of schools not just in terms of the pedagogical and didactical relation – that is, in terms of the difficulties and resistances of people when learning and teaching mathematics – but also in terms of the economic role that schools are asked to perform?

3. Changing the object does not change the cause

When referring to Damien Hirst’s piece, *For the Love of God*, Brown makes the point that the meaning of an object does not belong to the object as such, but is given by the “symbolic networks that assign meaning” (2011, p. 54) – Lacan’s symbolic order. These symbolic networks are economically determined: “our designations, subjectivations and self-definitions are inescapably quantified as a function of our exchange values and of our positioning in an economically defined world” (p. 54). By emphasizing *economy* as the inescapable world assigning meaning to our actions, Brown implicitly suggests that, if the purpose is to improve

the teaching and learning of school mathematics, perhaps cultural renewal is not enough. The economy of schools has to be addressed. The question is: how far does Brown go in thinking change in terms of economic change?

In order to tackle this question, one needs to address the crucial difference established by Lacan (e.g. 2004, 2008b) between *object of desire* – what someone desires – and the *object cause of desire* – what makes someone desire an object. For most mathematics education researchers, as well as for most teachers, the strategies to improve mathematics learning are centred in turning mathematics into the object of students' desire. However, if we follow Lacan's formulations, we have to acknowledge that the object in itself does not have the properties needed to become an object worthy of one's desire. A subject desires an object not due to its particular characteristics (its applications, its beauty, its power to generalise, etc.) but because of the place such an object occupies within their libidinal economy. For many students it is not that they lose the object of their desire – mathematics. They have the object – they are students, thus dealing with mathematics on an almost daily basis – but they literally *lose the desire for the object*: they lose the object cause of desire. It is the *cause* – the entire frame needed for desire to be articulated – that determines what one desires. For students with problems with mathematics, what they miss is not (a meaningful) mathematics, but the entire symbolic articulation that makes it meaningful for them to learn mathematics. Thus, and this is the central Lacanian insight into mathematics education, if the purpose of research is to make mathematics meaningful for students, its work should be centred not in the object mathematics, but in the entire frame that schematizes what it signifies for a student to learn mathematics, that is, in what makes a student desire mathematics.

What does make a student desire mathematics? At stake here is the fundamental *sociopolitical* structure of desire (Lacan, 2001; Žižek, 2008a). As Lacan (e.g. 2001) repeatedly asserted, *desire is the desire of the Other*, that is, far from coming from some 'inner will', desire comes from raising the question 'What does the Other want from me?' As Brown shows us throughout his exploration of Lacanian theory, it is upon this primordial question that our relation towards others, our making sense of the world, is constituted. Strictly speaking, *it is the Other that causes our desire*. The question about students' desire can be formulated thus: *who is the Other who causes students' desire to learn mathematics?*

For sure it is the dream of many mathematics educators to conceive mathematics itself as this Other: to believe that students' engagement in mathematics is driven by the cultural-historical attributes of a mathematical content – in the case of socioculturalism – or by the

“pursuit of noticing or asserting generality” in the case of Brown’s theorization (2011, p. 146). That is, to believe that mathematics as an object has already in itself the properties that will trigger students’ desire for learning. For many people who come across school mathematics, however, engagement in this subject does not derive from a ‘will to learn’, but from a will to satisfy some Other’s demand (say, parents’ demand for good grades, teachers’ demand for learning, academic or professional demands, etc.). It is an aspiration as pious as it is naive to assume that students will engage in mathematics for the satisfaction of exploring mathematics. It is the cause and not the object of desire that determines students’ engagement in mathematics. This cause has to be located not in intrinsic characteristics of mathematics nor in the innermost core of students’ being, but in politics; in what Brown calls, in the quotation at the beginning of this section, “the symbolic networks that assign meaning”.

In the Žižekian field, it is ideology which organizes our desires, which teaches us what and how to desire. If, as Brown argues, today’s ideology is one that supports capitalism as an economic system, then the conclusion to be drawn – and this is Žižek’s main point concerning political economy – is that it is capital itself that schematizes our desire. The desire of the student for the object mathematics results from the sociopolitical demand for them to succeed or fail. This is the cause of their desire. If the student loses such a cause – the case of many students for whom mathematics means nothing in terms of future possibilities – there is no point in ornamenting the object mathematics, by doing investigations instead of routine exercises, for instance. Eventually, mathematics could become students’ object of desire, and become enjoyable. Nevertheless, first there has to be a cause.⁵

Therefore, when Brown (2011) argues that “desire might be associated with the intrinsic excitement of mathematics to those who are absorbed in the mathematics *as* mathematics” (p. 179), I fail to recognize Lacan’s notion of desire. Nobody is ever absorbed in mathematics as mathematics, in the same way that nobody is ever absorbed in sex as sex; that is, without some kind of minimal fantasy sustaining the sexual act. Desire needs symbolic articulation; it needs a cause more than an object. Ultimately the kind of object occupying the place of what Lacan calls *object a* – the cause of desire – is purely accidental. This minimal fantasy has to be sought not in one’s intrinsic excitement, but in the sociopolitical arena. As stressed by Brown “in Lacan’s model the human subject is always trying to please someone” (p. 183).

⁵ That is, a minimum of sociopolitical significance as articulated in the field of the Other: “*jouissance* [enjoyment] is questioned, evoked, tracked, and elaborated only on the basis of a semblance” (Lacan, 1999, p. 92). This is true even for something apparently enjoyable in its own right: sex. As Žižek (2005) explores, even for the sexual act to take place, there has to be some kind of fantasy support. We cannot just ‘do it’; we have to narrativize it, ‘seeing’ ourselves doing it through the Other’s gaze.

So, again, the question is: who is this ‘someone’ who students try to please when they are absorbed in mathematics as mathematics?

4. *Jouissance* and surplus value

In chapter 8 of his book, Brown introduces the Lacanian notion of *jouissance* or *enjoyment* to address the case of Brenda, a school teacher experiencing difficulties in occupying the official discourse, whilst reconciling it with more personal reflections made during the practitioner research process (she was also at the same time a doctorate student researching her own practice as a teacher). Brenda felt that her conceptions of what constituted a good education were not fitting well with the new official doctrine, centred on explicit achievement objectives: “how would I accommodate the mismatch between my perceived reality and this proposed ideology? Would it entail a change in my ideological stance? Or could I work with a mismatch?” (Speech of Brenda, quoted in Brown, 2011, p. 186). Yet, as explored by Brown, Brenda’s attempt at working through these conflicts led to some surprising results. Although Brenda, at one level, shows a distance from the official ideology – which imposes more control on teachers’ work, when in her practice she gets attached to this discourse as she finds some ‘pleasure’ – *jouissance*/enjoyment in Lacanese – in performing such prescribed tasks. In particular, she found pleasure in being praised by the inspector responsible for target-setting: “I [had] accepted an imposed idea that I felt did not really address educational improvement. Yet I gained pleasure through the praise I received about my competence” (Speech of Brenda, quoted in Brown, p. 187). Brown’s analysis of this episode, based on Žižek’s concept of ideology, is right to the point: ideology catches its subjects not through a rational conscious adherence to its ‘values’, but by means of an unconscious enjoyment. The attachment to something we know is ‘wrong’ can only be explained in terms of enjoyment: although the ideology has been exposed, we still do not change our behaviour because *we enjoy it*. In the case of Brenda, she knows very well the ideology of what Brown calls “administrative structures” (p. 171)⁶ behind the curriculum, nevertheless she enjoys playing her role.

⁶ Žižek’s more precise here: these ‘structures’ that determine teachers’ work are the structures of capitalist economics. Throughout the book, Brown never poses capital itself as the determining force colouring our action in the world. Although he discusses the commoditization of mathematics, the restrictions imposed on teachers and students by the need for accountability, and the administrative control imposed by governments, he never posits capital as the ‘concrete universal’ of our historical époque, that is, as something that “while it remains a particular formation, it *overdetermines* all alternative formations, as well as all noneconomic strata of social life” (Žižek, 2004, p. 3). The sense I get from reading Brown’s book is that capital gets watered down into a set of obstacles – administrative, bureaucratic, governmental – and personalised into groups of people – controlling

Thus, when Brown says that ‘the renewal of mathematics is often in the hands of those controlling the curriculums, and wishing to exercise that control in the name of “raising standards”’ (p. 51), maybe he is overlooking the role of all of those who, while not really believing in those in power, keep acting as if they do. The problem is not a group of people that screw the system. As the case of Brenda shows, it is all of us that, although criticizing the system, keep acting accordingly. There is an unconscious attachment to the system as such.⁷

As pointed out by Brown (2011, pp. 119–126), the Lacanian subject is a barred subject, it lacks something. This lack is, first of all, a lack of *jouissance* (Lacan, 1999, 2007), the lack of a real enjoyment which is always posited as something lost, a lost fullness, the part of ourselves that is castrated when we enter the symbolic system of language and social relations: “The means of *jouissance* are open on the principle that he has renounced this closed, foreign *jouissance*, renounced the mother” (Lacan, 2007, p. 78). This renunciation is concomitant to the emergence of the signifier. The *jouissance* that is sacrificed, lost, is not simply annihilated, vanished, but it shifts to the Other. Henceforth, it will be through the signifier chain that *jouissance* can be attained.⁸ As Lacan (1999) pointed out “the signifier is the cause of *jouissance*” (p. 24), and “knowledge is the means of *jouissance*” (2007, p. 89). The role of the symbolic order – the Law – is to divide up, distribute, or reattribute everything that counts as *jouissance* (Lacan, 1999, p. 3). This is precisely what the case of Brenda exemplifies. Brenda enjoys only by being caught in a signifying way; what she enjoys is not ‘herself’ but a part of the Other’s body (in this case, the National Numeracy Strategy in Britain).

In *Seminar XVII, The Other Side of Psychoanalysis*, Lacan (2007) settled some of the most shattering connections between the dynamics of capitalism and the constitution of subjectivity.⁹ For Lacan (1999, 2007), the basic structural feature of subjectivity is that a lack

the curriculum, seeking for accountability – that are then seen as malfunctions, contingent occurrences of an otherwise good system.

⁷ This is a case of what Judith Butler calls a “passionate attachment” (Butler, 1997), where the very submission of oneself to discipline also produces libidinal activity. That is, the subject actually *enjoys* being submitted to disciplinary mechanisms. As phrased by Butler (1997), “the repressive law is not external to the libido that it represses, but the repressive law represses to the extent that *repression becomes a libidinal activity*” (p. 49, quoted in Žižek, 2008b, p. 300, my emphasis). This explains why people continue to be attached to discursive or ideological forms of submission, even after becoming completely aware of them. What binds us to explicit ideologies or discursive practices of subjectification is not a rational decision to do so, but an unconscious mode of enjoyment.

⁸ *Jouissance* is a complicated term in Lacanian theory, and it is used in different ways to signify different things. Here I am referring to the *jouissance* of the signifier, the one that is attained through the symbolic disposition of language. I am not referring to the phallic *jouissance*, the raw flow of pleasure of the primordial father which relates with the signifier in a different way. See Lacan (1999, 2007).

⁹ The basic feature uniting Marx’s theory of political economy and Freud’s psychoanalysis is the idea that there is something that *overdetermines* an individual’s acting in the world. Marx situated this overdetermination in

or loss is generated which then circulates in the Other. This lack is *jouissance* itself, which Lacan equates with Marx's notion of *surplus value*: "a certain day surplus *jouissance* became calculable, could be counted, totalized. This is where what is called the accumulation of capital begins" (2007, p. 177). What Marx denounces in surplus value is the spoliation of *jouissance* (p. 81). In Marx's theory of political economy, the surplus value is that value resulting from the effectivisation of a worker's labour that does not get back to the worker, but is instead transferred to the Other qua 'free' market. The employee never enjoys that surplus product: they 'lose' it. There is something that the worker has to lose, to alienate, if they want to engage in capitalist economics. The capitalist, as Other, enjoys that excess product, leaving the subject in the situation of working for the Other's enjoyment, as Brenda does. As pointed out by Fink (1995, p. 96), "like surplus value, this surplus *jouissance* may be viewed as circulating "outside" of the subject in the Other". In the same way that capitalism creates a loss in its field, which allows an enormous market mechanism to develop, the advent of subjectivity also creates a loss, and, for Freud as well as for Lacan, that loss is at the centre of civilization.

However, in order to be efficient, workers' loss needs to be articulated within an ideology that seeks to present capitalism as the meeting between equal parts in the free market. That is, as implying no loss at all. At the level of subjectivity, fantasy functions in very much the same way: it is the subject's way of organizing their world without being constantly confronted with the trauma of the lost *jouissance*. The way Brenda organizes her libidinal economy as to actually enjoy performing controlling tasks can be described as a fantasy avoiding her confronting her deep discomfort with such educational politics, that is, from confronting her own desire.

In his later seminars, Lacan (1999, 2007) nails down object a – the cause of desire – as surplus *jouissance*. The cause of our desire, what makes us desire what we desire, is schematized in the field of the Other's *jouissance*. According to Lacan (2007, p. 201), the object cause of desire – object a – is the place Marx revealed as surplus value. In our contemporary society, it is the logic of capitalist economics that regulates *jouissance*. Surplus value stands for the object cause of desire, as that which is most highly prized and valued by the subject. As such, what Lacanian theory instigates us to do is to posit capital itself as the cause of students' desire to learn mathematics as well as the cause of Brenda's efforts to

what he called the *infrastructure*, that is, the economic mode of production, while in Freud this overdetermination takes place at the level of the unconscious. Lacan's reading of Marx in *Seminar XVII* brings together economy and unconscious into a unitary theoretical discourse.

comply with the National Numeracy Strategy. Ultimately, this 'Other' that both students and teachers try to please when dealing with school mathematics is the capitalist system. Lacanian theory invites us to understand the nature of students' engagement not in terms of the object mathematics, but in terms of the place this object occupies as a school subject that students need to pass in order to keep up with life. What students enjoy when doing mathematics is not mathematics itself, but what circulates in the Other as school credit.

5. Fetishism and mathematics

So, if we follow Lacanian theory, we are instigated to posit credit as the cause of students' desire, and mathematics, with its power, utility, beauty and the like, as the necessary ideology masking the real – object a – of school's credit system. This encourages us to take a certain critical distance towards the object mathematics. A distance enabling us to see mathematics not in itself, but as being articulated in the field of the Other – capital.

Such a move, which concerns the relation between a structured network and one of its elements, is best rendered by Marx's notion of *commodity fetish* (Marx, 1976). In capitalism, the value of a commodity is no longer defined by its use (by the 'meaning' it has for the people who use it), but by the place it occupies in the set of all commodities, which defines its exchange value. The fetishism arises when we misperceive the purely formal or structural determination of an object's value as being a direct property of that object: "what is really a structural effect, an effect of the network of relations between elements, appears as an immediate property of one of the elements, as if this property also belongs to it outside its relation with other elements" (Žižek, 2008c, p. 19). Marx gives the example of the king to illustrate this misrecognition: "For instance, one man is king only because other men stand in the relation of subjects to him. They, on the contrary, imagine that they are subjects because he is king" (Marx, 1976, p. 82). The kingship of a king is a result of the network of social relations between a 'king' and his 'subjects', however,

to the participants of this social bond, the relationship appears necessarily in an inverse form: they think that they are subjects giving the king royal treatment because the king is already in himself, outside the relationship to his subjects, a king; as if the determination of 'being-a-king' were a 'natural' property of the person of a king. (Žižek 2008c, p. 20)

The fetishist misrecognition consists in believing that the attributes of a given element are the

result of some direct characteristics of this element, and not an effect of the place this element occupies within a given set of social relations.

As I explore elsewhere (Pais, 2013), the reasons invoked to justify the importance of mathematics in schools are conceived in terms of its inherent characteristics, whether they are related to the development of mental functions, the utility of this school subject for people's lives, its beauty, cultural richness, or the ideals of citizenship. Mathematics seems to embody the right properties that make it important. Yet what we perceive as the direct properties of mathematics are indeed a result of the place this subject occupies within capitalist schooling. As Brown (2011) says, "the signifier, or name, stands in for, even produces, the object it seeks to locate" (p. 15). This means that the attributes of an object – Lacan's *enunciated content* – do not belong to the object itself, but are produced by the place this object occupies within a given symbolic formation – Lacan's *place of enunciation*. As such, when Brown says that "the signifier of test performance has become at least as important as the signified mathematical capabilities" (p. 59), he is underestimating the power of the signifier over the signified. It is not that there is a signified 'mathematical capabilities' that have been corrupted by the signifier of 'test performance'. As stated by Brown above, the signifier *produces* the object, that is, it is the capitalist logic of test performance that produces the (ideology) of the importance of mathematics as 'capability'. The belief in the power of mathematics in optimizing the mundane lives of individuals or in allowing students to understand "the discipline's aesthetic qualities and in finding ways to enable our students to share these pleasures" (p. 59) functions as an ideological screen that simultaneously conceals its motives whilst making them actual and effective.

However, the notion of commodity fetish is not only about misperception. As noticed by Marx, a fetish persists even after its illusory nature has become transparent: the "discovery [of the illusionary character of a commodity], while removing all appearance of mere accidentality from determination of the magnitude of the values of products, yet in no way alters the mode in which that determination takes place" (Marx, 1976, p. 166). We may very well recognize an ideological fiction as a fiction, but nevertheless this fiction still works. In other words, we may very well know that our economic system is unfair, that schools are subjected to economic pressures, but nonetheless its functioning is *real*, i.e. it does not depend on our knowledge of it.

Researchers today know that mathematics serves other purposes than the ones preached by researchers and governments in terms of knowledge and competences. The fields of

ethnomathematics, *critical mathematics education* and, more generally, what have been known as the *social*, *cultural* and *political* perspectives in mathematics education have shown how mathematics is involved in processes of social selection, in excluding groups of people considered to be disadvantaged, or in providing a clear social mechanism of accountability and accreditation. A recent special issue on social theory published in this journal contemplates research where it is shown how mathematics is used as an economic measure (Tsatsaroni & Evans, 2013), a technology of subjectification (Kanes, Morgan & Tsatsaroni, in press) or as a mechanism of social selection (Jorgensen, Gates & Roper, 2013). These studies compel us to think about the importance of mathematics not in terms of object mathematics – as valuable knowledge and competence – but in terms of the role it plays and its attendant submissions to political as well as economic criteria and goals. However, when *researching research* (Pais & Valero, 2012), particularly research streaming from the social and sociopolitical turn, we notice how researchers, notwithstanding knowing that mathematics is used in schools as an accreditation instrument, nevertheless insist on the importance of mathematics as knowledge and competence. In this mechanism of *fetishist disavowal* (Žižek, 2008b) one knows, but one does not really believe what one knows, and thus keeps acting as if one does not know.

As a result, researchers proceed by identifying what Lundin (2011) calls the *missing link* – what is standing in the way of a meaningful and successful mathematics for all – and design strategies to overcome it. For some researchers the missing link is the lack of real-life problems in the teaching of mathematics (Pais, 2013), for others it is the lack of attention to students' culture (Pais, 2011), while for others the problem could be a lack of critical mathematics (Pais, Fernandes, Matos & Alves, 2012). In Brown's theorization, emphasis is given to "generating new stories, of defining new generalisations, with counting new entities as one [...] and with mapping out the domain of mathematics in novel and unexpected ways" (2011, p. 167), and in how this cultural renewal can be "distributed across the population as a wider attitude to teaching and learning" (p. 144). Brown posits the locus of change in mathematics itself. It is by transforming the object mathematics, and the entire pedagogy and didactics involved in the teaching and learning of this subject, that a change in the problem of failure can be achieved. Instead of conceiving failure as a *real* necessity of current schooling, research ends up creating ideological injunctions whose result is to mask the place mathematics occupies within schooling.

As I explored earlier, within Lacanian theory, what one desires is not the immediate thing, but what in it is more than itself: "I love you, but, because inexplicably I love in you

something more than you – the object petit a – I mutilate you” (Lacan, 2004, p. 263). One desires mathematics, but there is something in mathematics – object a, the credit attached to this school subject – that one desires more, so one destroys mathematics. What makes students desire mathematics is what in mathematics is more than itself: the object cause of desire, the school credit attached to this school subject. The same happens to many teachers: they want to teach mathematics, but they want even more their students to pass, so they destroy mathematics – doing routine exercise, meaningless ‘real’ problems, etc. – for the sake of the credit given by the exam. As the example of Brenda shows, this happens even if the teacher is fully aware that promoting ‘teaching to pass’ is a deficient way of learning mathematics. Theoretical knowledge does not abolish practical fetishism.

6. Is cultural renewal enough?

The discrepancy between an element and its place in a structure, between enunciated and enunciation, or between what we know and what we do (and enjoy) sheds a new light into Brown’s notion of cultural renewal as an emancipatory force in mathematics education. The question to be raised is how the idea of cultural renewal as proposed by Brown may end up making more effective what it criticizes – the increasing commoditization of education. Or, to paraphrase Žižek (2008a, p. 56), how can the enunciated rejection of an ideological hegemony involve the full endorsement of this same hegemony at the level of the enunciation? At stake here is the Lacanian premise that the existence of an object requires a place for it to exist – a ‘world’ in Badiou’s terms (Brown, 2011, p.148) – of which the object is a function. A mathematical object in a school is not the same as a mathematical object in the working sheet of a mathematician. What makes them different are the different worlds they inhabit. A student is first and foremost a student, frequenting a specific place called school, with particular rules and organisation of labour. Research insights such as ‘realistic mathematics’, ‘local mathematics’, ‘critical mathematics’ or, in the case of Brown, ‘counting-as-one’ are going to be implemented in schools – the position of enunciation. The latter determines the true content of these insights, so that, in the end, it becomes difficult to imagine how these suggestions can change any of the core features of the school’s credit system. To believe that our enunciated intentions are going to be implemented in schools without some kind of ‘misrecognition’ is to neglect the crucial role that the signifier has in attributing meaning that was not intended by the subject. As mentioned before, within Lacanian theory, the subject is *represented*, and it is the logic of this representation – the

logic of the signifier – that determines the subject's intentions. What does prevent Brown's idea of 'counting-as-one' becoming commoditized, and thus utterly determined by the place of enunciation?¹⁰

This is where I prefer to posit the dimension of *truth* that Brown brings up in his book: in the gap between the enunciated content and the position of enunciation. The truth of Brown's cultural renewal is the way his proposal is going to be placed in the enunciation – that is, in schools. How the real of school mathematics will articulate and make 'liveable' a proposal such as the one of 'cultural renewal'? The basic premise of Brown's approach is that culture has the power to "shape and renew the mathematics we encounter in schools" (2011, p. 167). However, for Lacan, culture functions not in the sense of renewal but in the sense of 'reaction', as an ideology set to conceal some traumatic real. Could 'cultural renewal' become another ideology concealing the real economic dimension of school mathematics? As pointed out by Žižek (2006, p. 348), since dominant social systems demand perpetual reforms as a means of integrating what could be new and potential emancipatory acts into well-established social structures, the system may very well use Brown's idea of 'cultural renewal' as a way to satisfy the societal demand for reforming mathematics education, while ensuring that these ideas will not actually change any of the core features of the school system. It is in this sense that Žižek says that today's capitalism needs to promote constant reforms and innovations to conceal the crude reality that core choices (such as a change in the economic mode of production; or a valorisation of work instead of knowledge when evaluating students, as proposed by Baldino and Cabral (2006)) are not available.

The crucial insight from Lacanian psychoanalysis, as I discussed before, is that the cause of students' desire is not articulated in terms of culture, but in terms of economy. It is not because one makes a cultural renewal that one has thereby done away with credit as the cause of students' desire. The symbolic machinations produced by mathematics education research have to address the real: the fact that there is something in school mathematics that cannot be reduced to knowledge. There is something *real* about schools functioning in the strict Lacanian sense: as something that never changes, something that does not depend on our idea

¹⁰ Imagining, for instance, an entire exam industry developing tests capable of evaluating students' capacity for generalizing, 'counting as one' inasmuch as PISA has become the ultimate examination designed to evaluate students' use of mathematics in everyday activities. Such a 'commoditization' has been happening with ideas coming from ethnomathematics (Pais, 2011) and critical mathematics education (Pais, Fernandes, Matos & Alves, 2012), two fields that are highly critical towards existing school mathematics. When ideas from these fields came into schools, instead of changing the current state of affairs, they ended up being completely co-opted by the logic of school accreditation. That happens because capitalism is in our days the place of enunciation, the place where the ultimate meaning of our enunciated intentions is determined.

of it. This something is the unconscious itself: knowledge that does not know itself (Lacan, 1999, p. 98). When Brown suggests that students' learning should be driven not by credit but by the quest for experiencing the eternity of mathematics' truth (Brown, 2011, p. 137), he is asking students to 'forget'—repress—the truth of schooling, and be focused on the truth of mathematics. In other words, he is asking students to forget their places of enunciation, their unconscious. But the entire purpose of the psychoanalytical act is precisely the opposite. It seeks to 'make the unconscious talk' by bringing into consciousness what has hitherto been repressed. And what has been repressed in mathematics education research is precisely the importance of this subject within a school's credit system.

7. What could an economic renewal mean?

Chapter 7 of Brown's book – 'The Cultural Renewal of Mathematical Learning' – is arguably the most experimental and challenging part of the book. Here, Brown (2011) goes into Badiou's philosophy, its relation with Lacan, and how the distinction between truth and knowledge might be understood in mathematics education. The main point of Brown's engagement with Badiou concerns the possibility that the latter gives of centring teaching on experimentation and critique rather than the delivery of existing knowledge. This poses important questions for our work as educators: "do we conceptualize our task in terms of initiating our students into existing knowledge? More radically, our task can be seen as troubling the certainties of that knowledge" (p. 138).

Brown is bringing into mathematics education the crucial question posed by Badiou apropos of philosophy: how does true change occur in a given situation? (Bosteels, 2006, p. 158). As a good Marxist, Brown knows that a true change in schooling is more a political than an educational matter. Chapter 8 of his book – 'The Political Shaping of Mathematical Learning' – describes how broader structures impact in decisive ways what is going on in schools. However, this last chapter contrasts with the examples explored by Brown throughout the book of what a change or renewal could mean for school mathematics. Although Brown acknowledges that the most important obstacles in achieving this renewal are structural ones, having to do with "administrations trying to administer populations of teachers and children with more or less predictable results against a register of externally defined standards" (p. 168), he assumes that school mathematics "is not located in a settled environment and its norms can be challenged" (p. 168). The question is: which norms and how can they be challenged? Brown suggests that the norms of schooling can be confronted

by challenging ways of thinking that trap us into past ways of making sense (p. 144). Through experimentation and critique, students and teachers can develop ways of working in the mathematics classroom that are not so easily regulated and assessed by governments (p. 142). It is assumed that such a cultural change will lead to a change in the governing of schools, albeit uncertain. This change is in the hands of students and teachers:

Lacan's conception of truth, as always being new, proposes for the teacher an educational alternative to being a mere purveyor of everyday discourse. Lacan's optimistic conclusion sees perpetual renewal as the mode of life that teacher and her students must live. (p. 168)

The paragraph continues with insights on how teachers can break the clutches of present cultural configurations, towards a future beyond their conceptions. Such a *hysterical demand on teachers* (Pais, 2012), who are seen as agents of change, notwithstanding all the socio-political constraints explored by Brown, contradicts his critique of mathematics education research:

Mathematics education research has had a tendency to be targeted at teachers, teacher educators and researchers and this activity masks us from the limited impact that it has. Such research can only ever reach a small proportion of such individuals restricting any process of dissemination. Yet even the capacity such individuals have for impact on broader states of affairs in mathematical learning must be questioned. Politicians and government administrators can often have more influence on the shape of mathematical learning in school through dealing with populations rather than individuals, social organisation through policy directives, rather than face to face encounters. Mathematics education research needs to be attentive to how such handling of populations impacts on broader conceptions of subjectivity and how we might impact on the factors that shape this subjectivity. (Brown, 2008a, p. 243)

Indeed, what some of the examples depicted by Brown show is that a change in mathematics education has to be located not in a group of well-intentioned and informed teachers, but in

the broader structural arrangements that determine teachers' work.¹¹ These broader arrangements are not cultural, but are located in what Marxists call the economic infrastructure, that runs indifferent to cultural changes. If we are thinking of a true change in the sense of Badiou, we should ask what it could mean for a change not only in the culture but also in the economy of schooling.

The first step will be to acknowledge that when people go to school they get introduced not only to a culture, but also to an economy (Baldino & Cabral, 2006, 2013; Lave & McDermott, 2002; Pais, 2012). We all agree that "the encounter with mathematics is a formative experience for the individual" (Brown, 2011, p. 144). The interesting question is how we conceive the nature of this formative experience. If we restrict our 'world', to use Badiou's term, to the 'world of mathematics', then the importance of this formative experience will be understood in terms of the mathematical experience alone, whether in terms of the usefulness that mathematics has in our daily life, in terms of the appropriation of cultural forms, or, as in the case of Brown, the opportunity to develop a sense of critique and experimentation towards mathematics. But if we posit mathematics within the 'world of schooling', then students learn many other things as part of their formative experience with mathematics. As Baldino and Cabral (1998, 2006, 2013) have been showing through their own experience as mathematics teachers, students in a mathematics class (as in any other class) learn above all to participate in and accept the conditions of production and seizure of surplus value. They learn the (unconscious) laws that regulate their *jouissance*. They learn that *jouissance* can only be attained through the Other, that is, through school's accreditation system. If we are talking about truth in terms of "a process that breaks decisively with all established criteria for judging (or interpreting) the validity (or profundity) of opinions (or understandings)..." (Hallward, 2003, pp. xxiii–xxiv, quoted in Brown, 2011, p. 136), then to experience school mathematics' truth one will also have to contemplate a break with existing practices of school accreditation. From what is available in Brown's text, no change was made in the way mathematics appears in school as a subject that students need to pass by

¹¹ Some parts of Brown's text evince a contradiction in the way he understands the concept of ideology. On the one hand, when he analyses the case of Brenda, he is well aware that ideology is not in the hands of a group of people, orchestrating our lives as if we were puppets, but is inherently dependent on the subjects who, while not really believing in it, keep acting as if they do. However, in others parts of the text, he seems to conceive ideology as an attribute of a group of people who use it in a conscious way to exert power over others (see, for instance, p. 167). I suggest that we should stick to Althusser's idea that ideology has no outside, we are always in it, not by a conscious decision to do so, but by the way we enjoy being in it. Capital exerts its power not by means of a conscious decision by the ones in power, but through the distribution of simple pleasures that keep people captive.

means of attaining credit. There are always ‘established criteria’ that cannot be broken, notwithstanding all the cultural breaks that, as some of Brown’s examples show, can indeed occur.

To break with the school’s credit system is not only hard, it is also unthinkable within the existing sociopolitical order. But then, if we follow Žižek’s notion of an *act* (1992) – which resembles Badiou’s notion of an event – such a break is precisely what characterizes a ‘true change’, a change that from the standpoint of the existing symbolic order is seen as impossible. To recover our previous discussion on desire, an act changes not only (or necessarily) the object of desire – in our case, mathematics – but the entire frame that makes a subject desire an object – the cause of desire, the credit system. A true act in mathematics education will have to involve a change in the way students are evaluated and promoted in schools. This is not an easy position to take. By means of an act a subject puts at stake everything, including themselves, their symbolic identity. If we take the case of Brenda, an act will be a clear refusal to participate in the National Numeracy Strategy, with all the consequences that this would have for her life, which can include losing her job. For a teacher an act could be a denial to be an agent of exclusion, by refusing to continue stamping people with numbers and letters. This is, of course, an unattainable position for anyone who wants to be a teacher. This is why Žižek (1992, p. 51) characterizes an act as always implying a ‘crime’, a transgression’, namely to the limit of the symbolic community to which one belongs. The argument of this paper shows that the limits of mathematics education research are the limits of cultural change. Once one suggests a change in the economic role of schools, things get ‘impossible’.

8. Final remarks

Brown explores a diverse array of situations where it becomes evident that there is more in school mathematics than mathematics itself. Solving the impasses of school mathematics – failure, meaningless training, instrument of accountability, etc. – requires a change that goes beyond the limits of mathematics education. However, and notwithstanding Brown’s recognition that the problems the community faces are sociopolitical ones, the way he conceives change is located in mathematics. The cultural renewal proposed by Brown is the renewal of mathematics, its teaching and learning. By reading Brown’s book, I sense that turning mathematics into students’ object of desire is a matter of making mathematics more pleasant, critical and experimental. But one of the central lessons of Lacanian psychoanalysis

is that students' desire is articulated in the field of the Other. And today's Other is capital, the place of enunciation where the meaning of our actions is defined. As such, Brown omits to give an account of credit as the object cause of students' desire. While in some parts of the book Brown seems to posit mathematics in the 'world' of schooling, with all the institutional, curricular, and economic constraints that such a world imposes on the teaching and learning of this school subject, when thinking about renewal and change, the 'world' seems to be the world of mathematics, with its pursuit of noticing or asserting generality. The real that remains unaddressed in Brown's proposal of cultural renewal is the real of school's credit system. A real disguised by the fantasy of a pleasurable, enjoyable, experimental and critical mathematics.

I know Brown has been accused of presenting a pessimistic view of mathematics education (Presmeg & Radford, 2008). Yet he is not pessimistic enough. He still has faith in changing the economy of school mathematics by changing its culture. The task is harsher than that, I argue. It implies an act, in the strict Žižekian sense, as an intervention into the real after which nothing remains the same (Žižek, 1992, p. 52), including school's credit system. In the current matrix of world social organization this does not seem possible. Yet a radical use of social theory in mathematics education gains from conceiving the importance of mathematics not in terms of mathematics itself, but in terms of the place this subject occupies within a given structural arrangement. There is something inherently wrong in the way researchers use social theory, and still behave as ambassadors of mathematics. No matter how much we would like mathematics to be an adventure into knowledge, the ultimate problem-solving technology or a crucial dimension of critical citizenship, this is not what school mathematics is. I suggest that school mathematics should be investigated as a crucial element of today's political and economic landscape, and not so much, as it is today, as a precious knowledge aimed to empower people and to enable societal development.

9. References

- Abreu, G., Bishop, A., & Presmeg, N. (2002). *Transitions between contexts of mathematical practices*. The Netherlands: Kluwer Academic Publishers.
- Althusser, L. (2000). *Freud e Lacan/Marx e Freud*. Rio de Janeiro: Edições Graal.
- Baldino, R., & Cabral, T. (1998). Lacan and the school's credit system. In A. Olivier & K. Newstead (Eds.), *Proceedings of 22nd Conference of the International Group for the Psychology of Mathematics Education (PME22)* (Volume 2, pp. 56–63). Stellenbosch, South Africa: University of Stellenbosch.

- Baldino, R., & Cabral, T. (2006). Inclusion and diversity from Hegel-Lacan point of view: Do we desire our desire for change? *International Journal of Science and Mathematics Education*, 4, 19–43.
- Baldino, R., & Cabral, T. (2013). The productivity of students' schoolwork: An exercise on Marxist rigour. *Journal for Critical Education Policy Studies*, 11(4), 1–15.
- Bosteels, B. (2006). Alain Badiou's theory of the subject: The recommencement of dialectical materialism? In S. Žižek (Ed.), *Lacan: The silent partners*. London: Verso.
- Brown, T. (2001). *Mathematics education and language: Interpreting hermeneutics and post-structuralism*. Revised Second Edition. Dordrecht: Kluwer.
- Brown, T. (2008a). Lacan, subjectivity, and the task of mathematics education research. *Educational Studies in Mathematics*, 68, 227–245.
- Brown, T. (2008b). Signifying “students”, “teachers” and “mathematics”: A reading of a special issue. *Educational Studies in Mathematics*, 69(3), 249–263.
- Brown, T. (2011). *Mathematics education and subjectivity: Cultures and cultural renewal*. Dordrecht: Springer.
- Brown, T. (2012). Subjectivity and cultural adjustment in mathematics education: A response to Wolff-Michael Roth. *Educational Studies in Mathematics*, 80(3), 475–490.
- Brown, T., & McNamara, O. (2011). *Becoming a mathematics teacher: Identity and identifications*. Dordrecht: Springer.
- Butler, J. (1997). *The psychic life of power*. Stanford, CA: Stanford University Press.
- Fink, B. (1995). *The Lacanian subject: Between language and jouissance*. Princeton, NJ: Princeton University Press.
- Gutiérrez, R. (2010). The sociopolitical turn in mathematics education. *Journal for Research in Mathematics Education*, 41(0), 1–32.
- Hallward, P. (2003). *Badiou: A subject to truth*. Minneapolis, MN: University of Minnesota Press.
- Jorgensen, R., Gates, P., & Roper, V. (2013). Structural exclusion through school mathematics: using Bourdieu to understand mathematics as a social practice. *Educational Studies in Mathematics*, 87(2), 221–239.
- Kanes, C., Morgan, C., & Tsatsaroni, A. (2014). The mathematics PISA regime: knowledge structures and practices of the self. *Educational Studies in Mathematics*, 87(2), 145–165.
- Lacan, J. (1999). *Encore: The seminar of Jacques Lacan book XX*. New York: Norton & Company.

- Lacan, J. (2000). *The psychoses: The seminar of Jacques Lacan book III*. London and New York: Routledge.
- Lacan, J. (2001). *Écrits*. London: Routledge Classics.
- Lacan, J. (2004). *The four fundamental concepts of psychoanalysis*. London: Karnac.
- Lacan, J. (2007). *The other side of psychoanalysis: The seminar of Jacques Lacan book XVII*. New York: Norton & Company.
- Lacan, J. (2008a). *My teaching*. London: Verso.
- Lacan, J. (2008b). *The ethics of psychoanalysis: The seminar of Jacques Lacan book VII*. New York: Taylor and Francis.
- Lave, J., & McDermott, R. (2002). Estranged learning. *Outlines*, 1, 19–48.
- Lundin, S. (2011). The missing piece: An interpretation of mathematics education using some ideas from Žižek. In C. Bergsten & E. Jablonka (Eds.), *Skrifter från Svensk förening för matematikdidaktisk forskning MADIF 7*. Stockholm: Stockholm University.
- Marx, K. (1976). *Capital, volume 1*. Harmondsworth: Penguin.
- Miller, A.-J. (1999). Interpretations in reverse. Originally published in *La Cause freudienne*, 32, 1996. Retrieved from http://www.londonsociety-nls.org.uk/JAM_reverse.htm on 13 January 2010
- Miller, A.-J. (2006). Suture: Elements of the logic of the signifier. *The Symptom* 8 (Winter 2007), 8–25.
- Morgan, C. (2014). Understanding practices in mathematics education: Structure and text. *Educational Studies in Mathematics*, 87, 129–143.
- Pais, A. (2011). Criticisms and contradictions of ethnomathematics. *Educational Studies in Mathematics*, 76(2), 209–230.
- Pais, A. (2012). A critical approach to equity in mathematics education. In O. Skovsmose & B. Greer (Eds.), *Opening the cage: Critique and politics of mathematics education*. Rotterdam: Sense Publishers.
- Pais, A. (2013). An ideology critique of the use-value of mathematics. *Educational Studies in Mathematics*, 84(1), 15–34.
- Pais, A. (2014). Economy: The absent centre of mathematics education. *ZDM-The International Journal on Mathematics Education*, 46, 1085–1093.
- Pais, A. (in press). At the intersection between the subject and the political: A contribution to an ongoing discussion. *Educational Studies in Mathematics*.
- Pais, A., Fernandes, E., Matos, J., & Alves, A. (2012). Recovering the meaning of “critique” in critical mathematics education. *For the Learning of Mathematics*, 32(1), 29–34.

- Pais, A., & Valero, P. (2012). Researching research: Mathematics education in the political. *Educational Studies in Mathematics*, 80(1–2), 9–24.
- Presmeg, N., & Radford, L. (2008). On semiotics and subjectivity: A response to Tony Brown's "signifying 'students', 'teachers', and 'mathematics': A reading of a special issue". *Educational Studies in Mathematics*, 69, 265–276.
- Radford, L., & Roth, W.-M. (2011). Intercorporeality and ethical commitment: an activity perspective on classroom interaction. *Educational Studies in Mathematics*, 77, 227–245.
- Roth, W.-M. (2012). Re/writing the subject: A contribution to post-structuralist theory in mathematics education. *Educational Studies in Mathematics*, 80(3), 451–473.
- Skovsmose, O. (2005). *Travelling through education: Uncertainty, mathematics, responsibility*. Rotterdam: Sense Publishers.
- Sriraman, B., & English, L. (2010). Surveying theories and philosophies of mathematics education. In B. Sriraman & L. English (Eds.), *Theories of mathematics education: Seeking new frontiers*. Heidelberg: Springer.
- Valero, P. (2004). Socio-political perspectives on mathematics education. In P. Valero & R. Zevenbergen (Eds.), *Researching the socio-political dimensions of mathematics education: Issues of power in theory and methodology*. Boston: Kluwer.
- Tsatsaroni, A., & Evans, J. (2013). Adult numeracy and the totally pedagogised society: PIAAC and other international surveys in the context of global educational policy on lifelong learning. *Educational Studies in Mathematics*, 87(2), 167–186.
- Žižek, S. (1992). *Enjoy your symptom! Jacques Lacan in Hollywood and out*. London: Routledge Classics.
- Žižek, S. (1994). The spectre of ideology. In S. Žižek (Ed.), *Mapping ideology* (pp. 1–33). London and New York: Verso.
- Žižek, S. (2004). *Organs without bodies: Deleuze and consequences*. London: Routledge.
- Žižek, S. (2005). *The metastases of enjoyment: Six essays on women and causality*. London: Verso.
- Žižek, S. (2006). *The parallax view*. MIT Press.
- Žižek, S. (2008a). *The plague of fantasies*. London: Verso.
- Žižek, S. (2008b). *The ticklish subject*. London: Verso.
- Žižek, S. (2008c). *The sublime object of ideology*. London: Verso.
- Žižek, S. (2012). *Less than nothing: Hegel and the shadow of dialectical materialism*. London: Verso.

